## Alg. 2 Warm Up # 9-4

1. Given the parabola $f(x) = x^2 - 2x - 3$, complete parts (a) through (c) below.

   a. Find the vertex by averaging the $x$-intercepts.

   b. Find the vertex by completing the square.

   c. Find the vertex of $f(x) = x^2 + 5x + 2$ using your method of choice.

   d. What are the domain and range for $f(x) = x^2 + 5x + 2$?

## HW Questions:

3-51. While Jenna was solving the equation $150x + 300 = 600$, she wondered if she could first change the equation to $x + 2 = 4$. What do you think?

   a. Solve both equations and verify that they have the same solution.

   b. What did Jenna do to the equation $150x + 300 = 600$ to change it to $x + 2 = 4$?

   c. Use the same method to rewrite and solve $60t - 120 = 300$.

3-52. Consider the sequence $10, 2, \ldots$

a. Assuming that the sequence is arithmetic with $t(1)$ as the first term, write the next four terms of the sequence and then write an equation for $t(n)$.

b. Assuming that the sequence is geometric with $t(1)$ as the first term, write the next four terms of the sequence and then write an equation for $t(n)$.

c. Create a totally different sequence that begins $10, 2, \ldots$ For your sequence, write the next four terms and an equation for $t(n)$.

| $n$ | 1 | 2 |
|---|---|---|
| $t(n)$ | 10 | 2 |

3-53. Rewrite each radical below as an equivalent expression using fractional exponents.

a. $\sqrt[2]{5}$ b. $\sqrt[3]{9}$ c. $\sqrt[8]{17^x}$ d. $7\sqrt[4]{x^3}$

$(17^x)^{1/8}$ $7 \cdot (x^3)^{1/4}$

$17^{x/8}$ $\frac{3}{1} \cdot \frac{1}{4}$

$7x^{3/4}$

3-54. Give the equation of each circle below in graphing form.

a. A circle with center $(0, 0)$ and radius 6.

b. A circle with center $(2, -3)$ and radius 6.

c. A circle with equation $x^2 + y^2 - 8x + 10y + 5 = 0$.

$(x-h)^2 + (y-k)^2 = r^2$

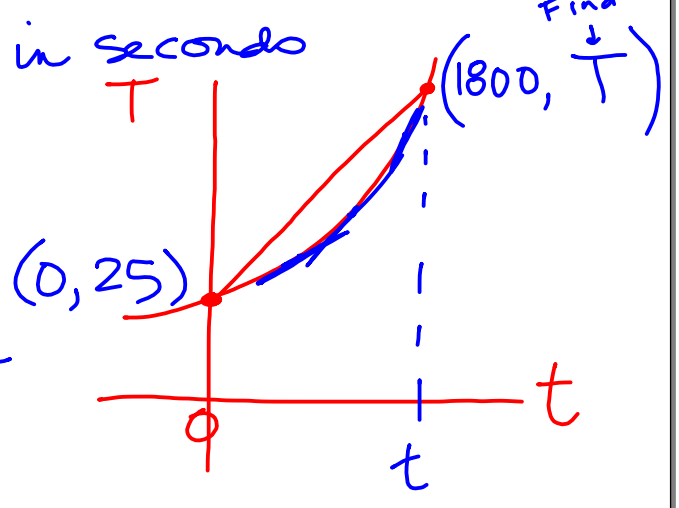
$x^2 - 8x + 16 + y^2 + 10y + 25 = -5 + 16 + 25$

$(x-4)^2 + (y+5)^2 = 36$

3-55. If the cooling system in a light-water nuclear reactor is shut off, the temperature of the fuel rods will increase. The temperature of the fuel rods during the first hour could be modeled by the equation $T = 680(1.0004)^t - 655$, where $t$ is the time in seconds, and $T$ is the temperature of the fuel rods in degrees Fahrenheit. **Average rate of change** can be calculated by finding the slope between two points. Find the average rate at which the temperature changes for the first 30 minutes.

Let $t$ = time in seconds

$(t, T)$



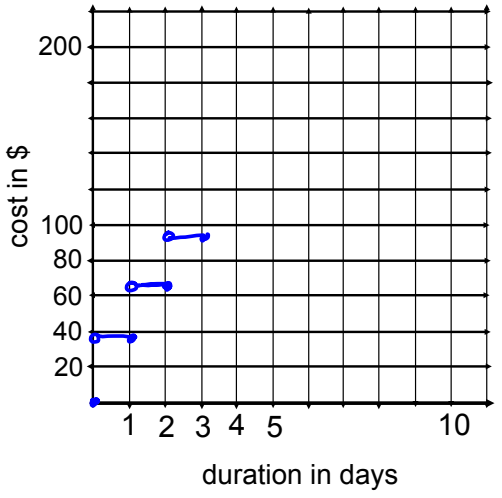

30 min $\cdot \frac{60 \text{ secs}}{1 \text{ min}}$

3-56. In the year 2006, the average cost to rent a car was $39 for the first day and an additional $23 for each additional day.

a. Graph the relationship between cost and the duration of a car rental in 2006.

b. Describe how the graph would be transformed if the current average cost of a car rental has increased to $50 for the first day.

50
−39




(Salmon WS)

Alg. 2 CP's: 3-#57-61 Name _____

3-57→60 (Revised) Per. ___ Team # ___

Combining Linear Functions

$f(x) = x - 2$ $g(x) = 2x + 3$

Predict what the shape of the graph will be when you combine f & g:

$f + g$ will be _____ $f \cdot g$ _____

$f - g$ will be _____ $\frac{f}{g}$ _____

Does the order of subtraction matter?

Will there be any exceptions to your prediction when you multiply 2 linear functions?

Write the result of each operation below:

$f(x) + g(x) =$ $f(x) \cdot g(x) =$

$f(x) - g(x) =$ $\frac{f(x)}{g(x)} =$

$g(x) - f(x) =$

Use a graphing calculator to graph $\frac{f(x)}{g(x)}$

Where will this new function be undefined?
Can you see that in your graphing calculator window?
(Use ZDecimal in the ZOOM menu)

Now enter: $h(x) = \frac{x-2}{x^2-4}$

Where will the function be undefined?

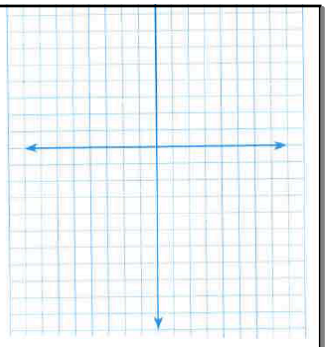
Can you see that in your grapher window?

Explain what's going on:

3-61 Closed Sets

Whole numbers include:

Integers include:



Whole numbers are a closed set under addition, but not under subtraction, for example:

For the whole numbers 3 and 5,

$3 + 5 = 8$ → The result, 8, is a whole number.

$3 - 5 = -2$ → The result, -2, is <u>not</u> a whole number.

a) Investigate the set of integers.

Closed set under addition? Examples:

Closed set under subtraction? Examples:

Closed set under multiplication? Examples:

Closed set under division? Examples:

b) Read in your book and answer the questions:

# HW: 3 -

# 63 ---> 69

Week 9 Classwork
WU on top
3- #1--->3
Pink (#13 - 21)
Purple (#37, 38)
Salmon (#57- 61)